

August 21, 1959

8/24/59
Content discussed
over telephone
with Mr. Ball.
RCB

Dear Dr. Knipling and Dr. Bushland:

Finally, here is the screwworm story that I would appreciate your checking. It has taken longer to write it than I expected; I had to do it kinda like you did the screwworm research--when other things and other people weren't demanding too much time. So I finally took this week off and buckled down to it.

I have checked the story with several people here; all think it is real interesting. READER'S DIGEST requested that I emphasize "Character and human drama," which I have tried to do. If I have said anything that is not true or that would embarrass either of you, please mark it.

My original draft contained several more details about the research, but I finally decided this slowed the story down and took too long to get to the action program. So in simplifying this, I am aware that I have glossed over some of the research details that were important to you. I hope you can go along with this, if they are points that will not matter to the average reader.

Also, I am aware of the fact that other researchers were involved in this project. But if READER'S DIGEST is to use the story, I feel that we just can't work in too many characters.

Bush, I never was able to reach Mr. Val Weyl or anyone else in his office but a secretary. She said he was on vacation for all of August. In addition to you and Dr. Knipling, however, I have talked with Dr. Campbell, Mr. J. C. Pierce, Jr. and Dr. Laake. I don't believe I have included any results of the eradication program, other than those given me by Dr. Campbell and Mr. Pierce. If you see something, however, that should be checked with the Animal Disease Eradication Division, I'll be happy to do so. Oh yes, the general information on the Southwestern program came from Mr. Norman Moser, President of the Texas and Southwestern Cattle Raisers Association, and from Mr. Peterson, Assistant Secretary of Agriculture.

Thanks a million to both of you for your cooperation. I only hope the story does your brilliant research justice and that it will get used. If you have only minor corrections to suggest, please mark them in the

8/24/87
Gordon's
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margins of this copy and return in the attached envelope. If there are some major or minor points that you prefer to discuss, please do not hesitate to call me collect Monday at Lakeside 1-5080.

Sincerely yours,

Charlie

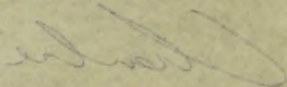
Charles E. Ball

CEB:ad
att.

*Bush — I'm sending a copy to
Dr. Kripling's home as well as his office.*

margin of this copy and return in the attached envelope. If there are some major or minor points that you prefer to discuss, please do not hesitate to call me collect Monday at LAkeSide 1-5080.

Sincerely yours,



Charles E. Ball

CEB:ed
etc.

*I. Thompson, Room 201, 1000
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a copy of the
2*

To Palmer

Page No.

From Ball

Copy from Farm Journal

Set 9 on 9½ pt. Bodoni Book

Article They're Releasing 50,000,000 Flies A Week!

Sheets—No. 1 Issue Reader's Digest

SOUTHERN

1	<u>Alternate Titles</u>		
2			
3	RELEASED: 50,000,000 Flies A Week!		
4	TURNED LOOSE: 50,000,000 Flies A Week!		
5	Their Business--Raising Sterile Flies!		
6	Breeding Flies Is Big Business!		
7	Released Last Year: 2,500,000,000 Sterile Flies!		
8	Their Unique Business: Breeding Sterile Flies!		
9	The Miracle of the Sterile Fly.		
10	They're Breeding-Raising 50,000,000 Flies A Week!		
11	The Sex Life of Flies		
12	What Happens to A Fly That Mates Only Once.		
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To Palmer

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SOUTHERN

1 Early each morning for the past year-
2 and-a-half, a squadron of some 20 air-
3 planes took to the air from Florida air-
4 strips, carrying a unique and deceiving
5 cargo--sterile male flies! Then,
6 following prearranged flight patterns, the
7 pilots purposely and precisely dumped
8 this valuable cargo over cities, pastures
9 and swamps at the astounding rate of
10 50,000,000 flies a week.

11 Wierd as this may sound, it's part
12 of the incredible Southeastern Screwworm
13 Eradication Program, lauded by Florida
14 ranchers as "the most wonderful thing
15 that ever happened to our industry!"

16 Screwworms are the larvae or maggots
17 of blow flies, which lay their eggs in
18 fresh flesh or open wounds of live
19 animals. They have been costing South-
20 eastern cattlemen a staggering \$20 million
21 a year, not to mention the infinite suffering
22 of helpless animals.

23 The magnitude and drama of this
24 fabulous project is equalled only by
25 the faith and unswerving determination

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Issue _____

SOUTHERN

1 of the two young scientists who conceived
2 the idea and saw it through.

3 While sipping coffee in a U. S.
4 Department of Agriculture laboratory at
5 Menard, Texas, E. F. Knipling (Nip-ling)
6 theorized to H. C. Bushland: "It appears
7 that the female fly mates only once during
8 her lifetime. Thus, if we could only
9 release enough sterile males, we could
10 eradicate the screwworm!"

11 This was in 1938, when both men were
12 in their late 20's. But the idea was
13 so fantastic that it drew little more
14 than smiles and snickers from "wiser and
15 more experienced" scientists. The shy
16 and modest Knipling, a farm boy who was
17 taught to respect age and authority by
18 his German parents, grew embarrassed to
19 even discuss it with any but his closest
20 friends. So fellow scientists assumed
21 that "Knipling's pipe dream" had "appropriately
22 been dropped."

23 That is, until 1946 when he moved
24 to Washington as Chief of USDA's Insects
25 Affecting Man and Animals Branch. "I

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SOUTHERN

1 hadn't forgotten it for a day!" he de-
2 clares. Instead he spent many hours co-
3 gitating and calculating on the possi-
4 bilities and convinced himself that it
5 wasn't a pipe dream!

6 "Knip" doesn't know the meaning
7 of time," says a former boss. "He's a
8 scientist's scientist, with a brilliant
9 research mind, a smooth temper, unending
10 patience and a keen desire for more
11 knowledge." At 49 years of age now,
12 this trim man has given up his boyhood
13 hobby of rifle hunting for the even more
14 sporting bow and arrow hunting.

15 Although his theory seemed more
16 feasible after a dozen years ticked by,
17 one key question remained unanswered:
18 How to sterilize the males?

19 Then on a winter day in 1950, Knip-
20 ling discovered an article by Dr. H. J.
21 Muller, the world-known geneticist from
22 Indiana University, which said in effect,
23 "Too much radiation (X-ray or gamma-ray)
24 will sterilize insects or animals."

25 This was it--the break he had been

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Issue _____

SOUTHERN

1 waiting for! So he rushed Muller's
2 article to his former associate, Dr.
3 Bushland, with a hand note: "Go to it!"

4 By this time, Bushland had developed
5 a method of raising screwworms on artifi-
6 cial media--a simple mixture of hamburger
7 meat and animal blood at body temperature.
8 This meant that research could continue
9 without the previously necessary wounding
10 and infesting of live animals, a practice
11 that was repulsive to Bushland and torture
12 to the animal.

13 (The first screwworm known to science
14 was reported in 1858 by a Frenchman who
15 found it in a human in Guinea. Texas
16 cattlemen always have been plagued with
17 screwworms, which come up from Mexico.
18 But the pest didn't show up in the South-
19 east until 1934, when it was believed
20 that drouth cattle moving from West to
21 East carried some specimens in an open
22 wound.)

23 Knipling was having difficulty in
24 Washington, though, in finding either
25 scientific or financial support for his

*at the University of Texas
first time in the laboratory*

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1933

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Issue _____

SOUTHERN

1 theory. At the Atomic Energy Commission
2 and at several universities, scientists
3 still considered it impractical and
4 inachievable. And of course, a research
5 appropriation without proper scientific
6 backing was almost unheard of. He was
7 able to wrangle only \$20,000 a year for
8 research--equal to cattle losses of
9 about one hour on a hot summer afternoon!

10 But Bushland was bubbling with energy
11 and enthusiasm. So he started "scroung-
12 ing, chiseling and even breaking a few
13 rules," he now admits. For example, he
14 called on his ex-army colonel at Brooke
15 Army Hospital and arranged to use their
16 X-ray machines on Thursday afternoons,
17 the day off for the laboratory staff.
18 This is where most of the tedious irradi-
19 ation studies on screwworms were con-
20 ducted.

21 Then he went to the Oak Ridge
22 National Laboratory and talked them
23 into loaning him a small cobalt-60
24 gamma ray source that "would do the
25 same thing as X-ray but be much faster."

-more-

1 Back at home, between jaunts, he
2 was learning considerable about the sex
3 life of screwworm flies. It was true,
4 the females mated only once. But the
5 males were a bit more promiscuous--they
6 mated an average of five times. With a
7 practical knowledge of biology, Bushland
8 went one step further. He developed a
9 strain of "sexual athletes" that mated
10 an average of 17 times each!

11 This was an expedient step, since
12 the theory was to release large numbers
13 of sterile males, week after week, so
14 that the mathematical odds would be
15 against a fertile mating. Thus, within
16 a few generations, the numbers would
17 dwindle to zero.

18 The laboratory technique now de-
19 veloped, they moved to Florida to test
20 the theory in the field. But the real
21 test came later on Curacao, a small
22 Dutch island just off the coast of
23 Venezuela. Goats and sheep were
24 literally being eaten up by screwworms
25 there. By releasing 400 sterile male

1 flies per square mile per week for 14
2 weeks, Bushland's team performed what
3 the natives called a miracle--they con-
4 pletely eradicated screwworms from Curacao.

Dutch

5 Thus the theory was proven! And the
6 news beat him home. Immediately, Florida
7 cattlemen and their congressmen started
8 "chomping at the bits," wanting the
9 same program in the Southeast. So at
10 last, Bushland and Knippling could sit
11 back and let someone else carry the ball
12 for expended funds and an eradication
13 program.

14 "Which we were glad to do," declares
15 J. C. Pierce, Jr., former president of
16 the Florida Cattlemen's Association.
17 "We made repeated trips to Washington,
18 but officials there still couldn't see
19 the merits of this program or couldn't
20 comprehend our terrific losses from
21 screwworms.

22 "Finally, in 1957," he continues,
23 "to show Washington that we meant business,
24 we got the Florida legislature to ap-
25 propriate \$3 million for an eradication

1 program, providing the Federal government
2 would match it, which they did."

3 Now ready to strike the knock-out
4 blow, the program was turned over to
5 USDA's Animal Disease Eradication Division,
6 with Dr. Bushland serving as a consultant.
7 In a \$1 million plant at Sebring, Fla.
8 they now feed, raise and sterilize
9 screwworms in an "assembly line" that
10 reminds you of an automobile factory.

11 The irradiation process takes place
12 while the insect is in the pupae stage
13 (between the larvae and fly stages.)
14 Soon after the flies emerge, they are
15 placed in small boxes--200 to 400 flies
16 per box--and trucked to the waiting planes.

17 ← During irradiation, both males and
18 females are sterilized. So rather than
19 take the time to separate them, both
20 sexes are dropped.

21 How would you like to feed 50 million
22 flies? Each week they consume a whopping
23 80,000 pounds of meat (horse meat from
24 Mexico; whale meat from California and
25 Japan), 9,600 gallons of water and
4,500 gallons of whole beef blood!

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the growing maggots

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SOUTHERN

Sheets—No. 9 Issue _____

1 "Fly Security" at this Sebring plant
2 probably would baffle the Pentagon.
3 Imagine rearing 50,000,000 flies a week
4 and having to make sure that ^{not} ~~one~~ escapes!
5 Every crack and crevice in the three-acre
6 building has been sealed to insure against
7 reinfestation of the area with non-irrad-
8 iated or fertile flies.

9 The building has only one entrance
10 and you must go through a half-dozen
11 doors. In the first locker room, you
12 disrobe and leave all your clothes.
13 Then after passing through a darkened
14 vestibule to another room, you are
15 supplied with fresh "work clothes" and
16 shoes.

17 Upon leaving, the process is even
18 more strict
19 ~~sixtimes~~, including a shower and leaving
20 worn
21 the clothes ~~just~~ to be laundered.
22 Each shift of 39 workers requires one
23 laundryman and 2,400 pounds of clothing
24 are laundered every 24 hours.

25 This program started in January
1958. And last month, the good news
was released: ^{apparent} ~~apparent~~ Screwworms are virtually

-more-

before the government business

*3 million fertile flies
in every stock*

big party

*one other restricted or
at such a low level
that they are not bothering
the host was found in*

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Issue

SOUTHERN

1 eradicated in the Southeast. Since
2 Feb. 19, 1959, only two cases of screw-
3 worms have been confirmed east of the
4 Mississippi river.

5 Total cost of the eradication pro-
6 gram to date has been only \$7 million--
7 less than six months normal damage.
8 And the total cost of seven years re-
9 search, that made the program possible,
10 was a mere \$250,000. This probably was
11 one of the best investments--paying the
12 best dividends--ever made by agriculture!

13 Now, Texas and Southwestern cattle-
14 men--equally plagued with screwworms--
15 are anxious to get a similar program
16 going in their area. The problems are
17 greater here because new infestations
18 can fly in from Mexico. And eradication
19 cannot be fully accomplished in the
20 Southwest until part of Mexico is in-
21 cluded and a permanent "buffer zone" is
22 established. This would mean dropping
23 sterile flies in a band across Mexico,
24 say 100 miles wide, from now on.

25 But some leaders, in the cattle
industry and in Congress, view this as

1 the much-sought-for opportunity to show
2 our "Good Neighbor Policy" in a tangible
3 way. It would help the Mexican cattle
4 industry as well as ours.

In addition to all of this, the sterile male technique offers exciting possibilities for the eradication of many other insects. To name a few: the tropical fruit fly; cotton boll weevil; tobacco horn worm; sugar cane borer; certain mosquitoes; and the most serious of all insects, the tse tse fly, which carries sleeping sickness.

14 So it looks as if we haven't heard
15 the last of "Knipling's Pipe Dream," an
16 idea which a dedicated and determined
17 young scientist refused to let die.

19

END

